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EUROPEAN PATENT APPLICATION

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27.03.91 Bulletin 91/13(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IT LI NL SE(38) Date of deferred publication of the search report:
03.04.91 Bulletin 91/14(71) Applicant: **IMPERIAL CHEMICAL INDUSTRIES PLC**Imperial Chemical House, Millbank
London SW1P 3JF(GB)(72) Inventor: Randall, David
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(54) Novel chemical blowing agent.

(57) A method for the preparation of polymeric foams which comprises reacting an organic polyisocyanate with a cyclic carbonate having at least one isocyanate-reactive substituent attached to the carbonate ring.

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- IT coating; acid resistant acrylic coating; alkali resistant acrylic coating
- IT Crosslinking catalysts
 - (ammonium compds., for aq. coatings, contg. polymers with dioxolanone groups)
- IT Quaternary ammonium compounds, uses
 - RL: CAT (Catalyst use); USES (Uses)
 - (catalysts, for crosslinking of aq. coatings contg. polymers with dioxolanone groups)
- IT Crosslinking agents
 - (polyisocyanates and amino resins, for aq. coatings contg. polymers with dioxolanone groups)
- IT Coating materials
 - (acid- and alkali- and water-resistant, water-thinned, contg. polymers with dioxolanone groups)
- IT 12597-69-2, Steel, uses
 - RL: USES (Uses)
 - (aq. coatings for, contg. polymers with dioxolanone groups, water- and acid- and alkali-resistant)
- IT 85-42-7D, polyester derivs., graft polymers with acrylic compds.
 97-88-1D, graft polymers with polyesters and vinyl monomers 100-42-5D,
 graft polymers with polyesters and vinyl monomers 108-31-6D,
 2,5-Furandione, polyester derivs., graft polymers with acrylic compds.
 124-04-9D, Hexanedioic acid, polyester derivs., graft polymers with
 acrylic compds. 141-32-2D, graft polymers with polyesters and vinyl
 monomers 868-77-9D, graft polymers with polyesters and vinyl monomers
 26184-07-6 35227-05-5 57828-93-0 150622-93-8 150641-95-5
 150641-97-7 150769-22-5D, polyester derivs., graft polymers with acrylic
 compds.
 RL: USES (Uses)
- IT (aq. coatings, contg. polymers with dioxolanone groups, on steel)
- IT 931-40-8D, reaction products with dipropylene glycol monomethyl ether and
 isophorone diisocyanate and polyester 4098-71-9D, Isophorone
 diisocyanate, reaction products with dipropylene glycol monomethyl ether
 and hydroxymethyldioxolanone and polyester 25322-69-4D, Polypropylene
 glycol, reaction product with hexamethylene diisocyanate-
 hydroxymethyldioxolanone adduct and succinic anhydride 34590-94-8D,
 Dipropylene glycol monomethyl ether, reaction products with
 hydroxymethyldioxolanone and isophorone diisocyanate and polyester
 35483-86-4D, reaction products with dipropylene glycol monomethyl ether
 and hydroxymethyldioxolanone and isophorone diisocyanate 150622-84-7
 150622-87-0 150622-89-2 150622-91-6 150622-92-7D, reaction products
 with hexamethylene diisocyanate-hydroxymethyldioxolanone adduct and
 succinic anhydride 150623-71-5D, reaction products with polypropylene
 glycol and succinic anhydride
 RL: USES (Uses)
- IT (aq. coatings, on steel, water- and acid- and alkali-resistant)
- IT 96-29-7D, Methyl ethyl ketoxime, reaction products with
 hydroxymethylmethoxymethylpropionic acid and polyisocyanate 9003-08-1
 133757-73-0D, Burnock DN 980S, reaction products with
 hydroxymethylmethoxymethylpropionic acid and Et Me ketoxime
 148597-50-6D, reaction products with Et Me ketoxime and polyisocyanate
 RL: MOA (Modifier or additive use); USES (Uses)
- IT (crosslinking agents, for aq. coatings contg. polymers with dioxolanone groups)
- IT 100-85-6, Trimethylbenzylammonium hydroxide 429-41-4, Tetrabutylammonium
 fluoride 10534-59-5, Tetrabutylammonium acetate
 RL: CAT (Catalyst use); USES (Uses)
- IT (crosslinking catalysts, for aq. coatings contg. polymers with
 dioxolanone groups)

P.C. 15-11-'93. p. - = (2)

Ring System Data

$$\begin{array}{c} \text{O} \\ | \\ \text{O}: \quad : \quad \text{C} \cdot \cdot \cdot \cdot \text{C} \cdot \cdot \cdot \cdot \text{CH}_2 \cdot \cdot \cdot \cdot \text{O} \cdot \cdot \cdot \cdot \text{C} \cdot \cdot \cdot \cdot \text{NH} \cdot \cdot \cdot \cdot (\text{CH}_2)_6 \cdot \cdot \cdot \cdot \text{NCO} \\ | \qquad | \\ \text{O} \cdot \cdot \cdot \cdot \text{C} \cdot \cdot \cdot \cdot \end{array}$$

REFERENCE 1

FAN . CNT 1

	<u>PATENT NO.</u>	<u>KIND</u>	<u>DATE</u>	<u>APPLICATION NO.</u>	<u>DATE</u>
PI	JP 05098168	A2	19930420	JP 1991-259181	19911007
AB	Coating materials contain polymers having carboxy and/or carboxylate groups and 1,3-dioxolan-2-one group and optionally other polymers having no 1,3-dioxolan-2-one group. Thus, a coating material for steel contained Me methacrylate-Bu methacrylate-4-methacryloyloxymethyl-1,3-dioxolan-2-one-acrylic acid copolymer Et3N salt and a crosslinking agent, i.e., an Et3N salt of a Burnock DN-980S-Me Et ketoxime-2-hydroxymethyl-2-methoxymethylpropionic acid reaction product.				
ST	methacryloxymethyldioxolanone copolymer coating; water resistant acrylic				



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LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions,

namely:

1. Claims 1,6,7,8,9
2. Claims 2,6,7,9
3. Claims 3,6,7,9
4. Claims 4,6,7,9
5. Claims 5,6,7,9



CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid,
namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions.

namely:

see sheet -B-

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☒ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid,
namely claims: point 1 and point 3
- ☐ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims.

namely claims:



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EUROPEAN SEARCH REPORT

Application Number

EP 20 30 9955

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-3 224 983 (D'ALELIO) * Claim 1 *	1-4	C 08 J 9/08 C 08 K 5/15
A	US-A-2 628 945 (WAYNE) * Column 1, line 38 - column 2, line 23; column 6, line 25 - column 7, line 3; claim *	1-11	
A	US-A-4 568 702 (MASCIOLI) * Column 3, line 62 - column 4, line 16; claims 1-8 *	1-11	
A	EP-A-0 212 767 (ARCO) * Column 2, line 21 - column 3, line 30; claims 1,7,8 *	1-11	
A	EP-A-0 276 452 (HERCULES) * Page 1, line 11 - page 2, line 2; claims 1,3-5 *	1-11	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			C 08 G
Place of search		Date of completion of search	Examiner
The Hague		03 January 91	BOURGONJE A.F.
CATEGORY OF CITED DOCUMENTS			
X: particularly relevant if taken alone			
Y: particularly relevant if combined with another document of the same category			
A: technological background			
O: non-written disclosure			
P: intermediate document			
T: theory or principle underlying the invention			
E: earlier patent document, but published on, or after the filing date			
D: document cited in the application			
L: document cited for other reasons			
&: member of the same patent family, corresponding document			